

63. (new) The method of claim 21, wherein the at least one dicarboxylic acid is selected from the group consisting of adipic acid, azelaic acid, sebacic acid, cyclohexane dicarboxylic acid, terephthalic acid, naphthalene dicarboxylic acid, isophthalic acid, the lower (C₁ to C₆) alkyl esters of said dicarboxylic acids, and blends thereof.

REMARKS

Claims 1- 62 are pending in the subject application. In order to expedite prosecution, non-elected claims 14-16, 24-26, 30-33, 48, 49 and 56-58 have been cancelled herein, without prejudice. Applicants expressly reserve their right to pursue the subject matter of the cancelled claims in this or a co-pending application. Claim 21 has been amended. Claim 63 has been added. Support for the amendments to claim 21 and added claim 63 is found throughout the Specification, as filed, and no new matter is presented by these amendments. See, e.g., claim 21 as originally filed.

Favorable reconsideration in light of the amendments and remarks which follow is respectfully requested.

1. 35 U.S.C. §112 Rejections

Claims 1-13, 17-23, 27-29, 34-47, 50-55 and 59-62 are rejected under 35 U.S.C. §112, second paragraph, as being indefinite. The Office states that:

The claims are indefinite because it is not clear what is encompassed by a low polarity block or oligomeric block and thus, when the claims would be infringed. Additionally, it is not clear what constitutes substantial adhesion. Finally, the language "such as" used in claim 21 is indefinite because it is not clear whether it further limits the claim.

Applicants respectfully submit that the term "low polarity polymeric block" or "low polarity oligomeric block" are well-known to those of skill in the art. A low polarity oligomeric or polymeric block is also referred to as a low surface energy block and a low surface tension block. Such materials typically have a surface tension of lower than about 35 dynes/cm. See, e.g. Coatings Encyclopedic Dictionary, Published by Federation of Societies for Coatings Technology, Edited by S. LeSota, Blue Bell PA (1995). Some typical low polarity blocks are olefins, silicones and fluorinated

hydrocarbons. Liquids with a low surface energy have a tendency to wet any solid surface that has a higher surface energy than that of the liquid, thus, providing good adhesion. On the other hand, liquids with a surface energy higher than that of the solid surface will ball up and will not provide good adhesion.

Claim as amended 21 and new claim 63 clearly define the limits of the claimed invention such that the rejection should be withdrawn. Thus, it is respectfully requested that the rejection under §112 be withdrawn.

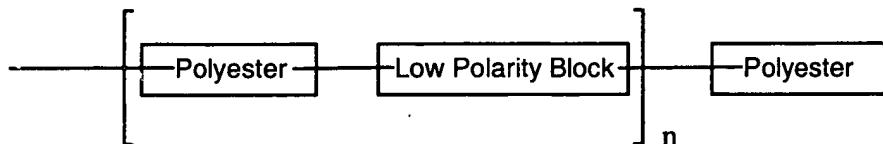
It is respectfully submitted that claims 1-13, 17-23, 27-29, 34-47, 50-55 and 59-62 meet the requirements under 35 U.S.C. §112.

2. 35 U.S.C. §102/103 Rejections

A brief description of the present invention may be of assistance in addressing the 102/103 rejections presented in the outstanding office action.

As provided by claim 50, the present invention provides adhesive or coating copolyester compositions having substantial adhesion where the composition comprises the reaction product of at least one difunctional alcohol, at least one dicarboxylic acid, and at least one low polarity telechelic oligomeric block material.

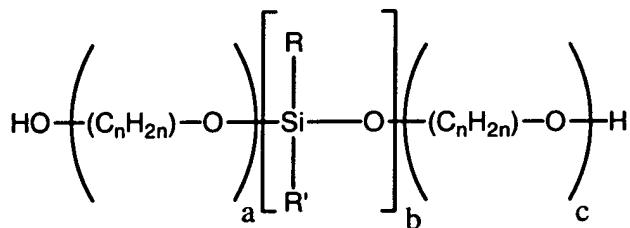
As is well known in the art, a difunctional alcohol and a dicarboxylic acid react to form a polyester through a dehydration-esterification process. Telechelic low polarity oligomeric blocks have functional groups suitable for coupling with either a carboxylate residue or an alcohol at the termini of the main chain of the oligomer such that the low polarity block may be imbued into the growing main chain of the polyester to form a block copolymer structure which may be represented by the generic structure:



wherein n is a positive integer.

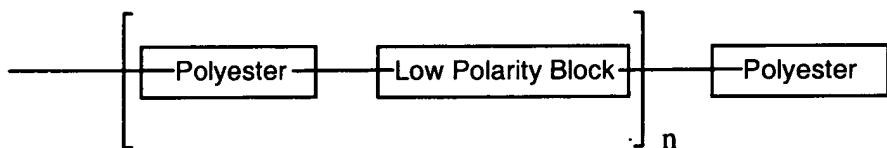
As provided in the specification, telechelic low polarity blocks suitable for use in the compositions of the present invention include: (1) saturated and unsaturated telechelic polyolefins having a weight average molecular weight of between about 500 and 4500, (2) ABA block copolymers where B is an alkyl and/or aromatic substituted polysiloxane, and where A is a functionally terminated polyalkyleneoxide, (3) telechelic fluoropolymers. See, for example, page 6, line 22 to page 7, line 14.

For compositions of the present invention in which the telechelic low polarity block is an ABA block copolymer the low polarity block of the generic structure provided above is represented by the following formula:



where R and R' are alkyl or aromatic groups, and a, b, and c are positive integers. See page 6, lines 29 to 33.

The invention further provides methods of improving adhesion of copolymers by incorporating a low polarity telechelic oligomeric block segment into the copolymer chain. Incorporation of telechelic oligomeric block segment into a copolymer results in formation of a block copolymer of the generic formula above, e.g., a block copolymer of the formula:



wherein n is a positive integer.

The invention further provides methods of making an adhesive or coating, comprising reacting at least one difunctional alcohol and at least one dicarboxylic acid

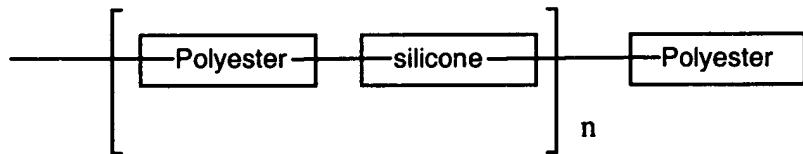
to form a copolyester polymer chain; and infusing at least one low polarity polymeric block into the copolyester polymer chain during the formation of the copolyester polymer chain.

Claims 1-12, 17-22, 35-47, 50-54 and 60-62 have been rejected under 35 U.S.C. §102(b) as anticipated by or, in the alternative, under 35 U.S.C. §103(a) as obvious over Lin. The Office states that:

The reference teaches a method of preparing a silicone containing polyester coating composition comprising reacting a difunctional alcohol and a dicarboxylic acid with a silicone resin. See examples. As it is not clear what is encompassed by a low polarity polymeric block and substantial adhesion, this rejection is made under 35 U.S.C. 102/103.

Applicants respectfully traverse this rejection.

Lin teaches a method of forming a block copolymer comprising polyester blocks and silicone blocks, e.g., a block copolymer of the generic formula:



Lin neither discloses nor suggests copolymers having a low polarity block incorporated into the polyester chain. Moreover, Lin neither discloses nor suggests polyesters having a low polarity block comprising (1) saturated and unsaturated telechelic polyolefins, (2) ABA block copolymers where B is an alkyl and/or aromatic substituted polysiloxane, and where A is a functionally terminated polyalkyleneoxide, or (3) a telechelic fluoropolymer.

In contrast, the present invention provides adhesive or coating compositions having a block (polyester)-alt-(low polarity block) structure in which the low polarity block is a telechelic polyolefin, a telechelic fluoropolymer or an ABA block structure.

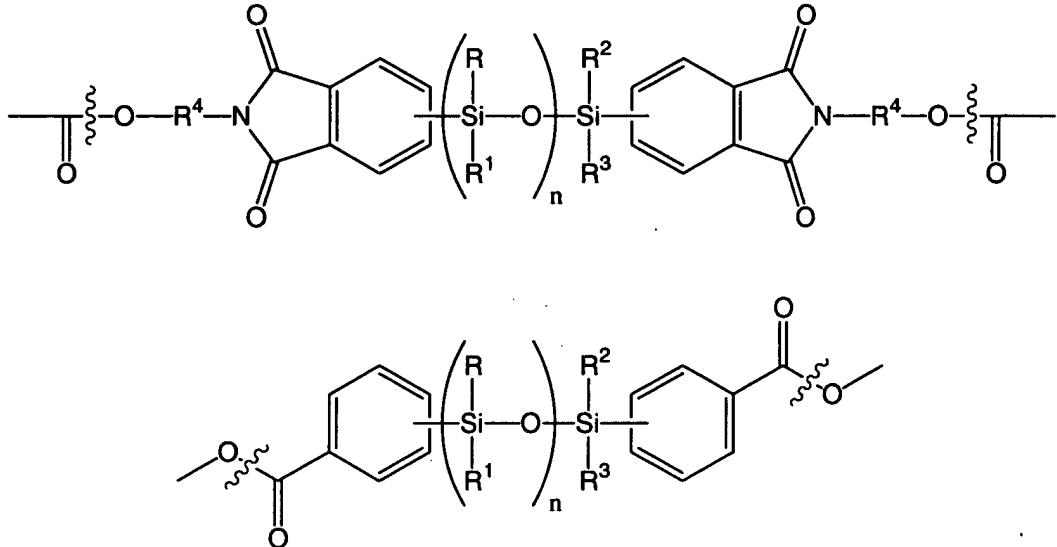
The coatings and adhesives of the invention would not have been obvious to one skilled in the art at the time of the invention based on the teaching of Lin.

Claims 1-13, 17, 20-22, 37-47, 50-53 and 60-62 have been rejected under 35 U.S.C. §102(b) as anticipated by or, in the alternative, under 35 U.S.C. §103(a) as obvious over Policastro. The Office states that:

The reference teaches a method of preparing a polyester-siloxane block copolymer comprising reacting a difunctional alcohol and a dicarboxylic acid with a siloxane resin. See examples. The block copolymers are useful as adhesives and coatings. See col. 4, lines 43-47. As it is not clear what is encompassed by a low polarity polymeric block and substantial adhesion, this rejection is made under 35 U.S.C. 102/103.

Applicants respectfully traverse this rejection.

As the reference is understood, Policastro teaches polyester-siloxane block copolymer in which the siloxane block is represented by one of the formulae:



Policastro neither discloses nor suggests a block copolymer having a low polarity block incorporated into the main chain of the polyester. Moreover Policastro fails to teach or suggest low polarity blocks comprising a telechelic polyolefin, a telechelic fluoropolymer or a telechelic ABA block structure wherein the A blocks are alkylene oxide polymers or oligomers and the B

block is a polysiloxane. Clearly the present invention would not have been obvious to one skilled in the art based on the poly(ester-silicone) block polymers taught by Policastro.

Claims 1-13, 17-23, 37-47, 50-53 and 60-62 have been rejected under 35 U.S.C. §102(b) as anticipated by or, in the alternative, under 35 U.S.C. §103(a) as obvious over Peters '158. The Office states that:

The reference teaches a method of preparing a polyesteramide-polyisobutylene block copolymer comprising reacting a difunctional alcohol and a dicarboxylic acid with a polyisobutylene. The block copolymers are useful as an adhesive. See col. 14, lines 25 through col. 15, line 52 and example 17. The claims do not exclude a diamine monomer. As it is not clear what is encompassed by a low polarity polymeric block and substantial adhesion, this rejection is made under 35 U.S.C. 102/103.

Applicants respectfully traverse this rejection.

As the reference is understood, Peters teaches block copolymers having a polyisobutylene block which has a high weight average molecular weight of between 5,000 and 30,000. Peters teaches that such high molecular weight polyisobutylene polymers may be used to form block copolymers with various other polymeric materials including polycarbonates, polyamides and polyesters. Peters neither discloses nor suggests using low molecular weight telechelic polyolefins such as polyolefins having a weight average molecular weight of between 500 and 4500 as provided by the instant application.

In contrast the present invention provides block copolymers having polyester blocks and low polarity blocks which exhibit superior adhesive properties when compared to other polyesters. Low polarity block copolymers suitable for use in the present invention include (1) saturated and unsaturated telechelic polyolefins having a weight average molecular weight of between 500 and 4500, (2) ABA block copolymers where B is an alkyl and/or aromatic substituted polysiloxane, and where A is a functionally terminated polyalkyleneoxide, or (3) a telechelic fluoropolymer. See, for example, at page 6, lines 28 and 29.

Claims 37-47, 50-54 and 62 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. §103(a) as obvious over each of Hallgren and Eichenauer. The Office states that:

Each of the references teaches a method of preparing a polyester-siloxane block copolymer that comprises incorporating a polysiloxane block into a copolyester chain. See examples. The block copolymers are useful as adhesives. See Hallgren at col. 1, line 32-36 and Eichenauer at col. 4, lines 16-18. As it is not clear what is encompassed by a low polarity polymeric block and substantial adhesion, this rejection is made under 35 U.S.C. 102/103.

As the reference is understood, Eichenauer merely provides block copolymers of a polysiloxane with either a polyester or a polyether. The block copolymers of Eichenauer are of the generic formula -[A-B]- wherein A is a polysiloxane block and B is either a polyester or a polyether or a random distribution of polyester and polyether. Eichenauer neither discloses nor suggests polyester block copolymers having imbued therein a low polarity block having an ABA structure (where A is a poly(alkylene oxide) and B is a polysiloxane). Moreover, Eichenauer neither discloses nor suggests that such block copolymers would have superior adhesive properties compared to other polyester resins.

Hallgren appears to teach methods of making silicone-polyester block polymers having an amide linkage between the silicone block and the polyester block. Applicants respectfully note that Hallgren, like Lin, merely recites polymers having polyester blocks and polysiloxane blocks. Hallgren neither discloses nor suggests incorporation of ABA block structures into a polyester main chain. Hallgren further fails to disclose or suggest that polyester compositions of the invention would exhibit superior adhesive properties.

In contrast, the polyester compositions of the present invention have a block structure in which at least one low polarity block is incorporated into a polyester resin. Moreover, the present invention provides polyester compositions having an ABA block structure incorporated into the polyester chain. No combination of the teachings of Hallgren and Eichenauer suggest the incorporation of a low polarity block structure into a polyester main chain. More particularly, the combination of Hallgren and Eichenauer fail to suggest incorporation of a

telechelic polyolefin, a telechelic fluoropolymer or an ABA block structure into a polyester resin to improve the adhesive properties of the polyester composition.

CONCLUSION

One skilled in the art would not have been motivated at the time of the invention by any combination of the cited art to make polyesters comprising low polarity blocks in the main chain such as (1) saturated and unsaturated telechelic polyolefins, (2) ABA block copolymers, and (3) telechelic fluoropolymers. Moreover, it would not have been obvious to one skilled in the art to improve polyester adhesion by incorporating low polarity block into a polyester resin based on any combination of the cited documents.

Reconsideration and allowance of claims 1-13, 17-23, 27-29, 34-47, 50-55 and 59-62 is respectfully requested in view of the foregoing discussion. This case is believed to be in condition for immediate allowance. Applicant respectfully requests early consideration and allowance of the subject application.

If for any reason a fee is required, a fee paid is inadequate or credit is owed for any excess fee paid, you are hereby authorized and requested to charge Deposit Account No. 04-1105.

Should the Examiner wish to discuss any of the amendments and/or remarks made herein, the undersigned attorney would appreciate the opportunity to do so.

Respectfully submitted,



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VERSION WITH MARKINGS TO SHOW CHANGES MADE IN CLAIMS

Please note that additions to the claims are shown underlined and deletions are shown in brackets.

Kindly amend claim 21, as follows:

21. (amended) The method of claim 20, wherein the at least one dicarboxylic acid is selected from the group of: aliphatic diacids having from 4 to 36 carbon atoms, [C₄ to C₃₆ such as adipic acid, azelaic acid, sebacic acid, cyclohexane dicarboxylic acid, or] aromatic diacids [such as terephthalic acid, naphthalene dicarboxylic acid, isophthalic acid], the lower (C₁ to C₆) alkyl esters of said dicarboxylic acids, and blends thereof.

Please add new claim 63, as follows:

63. (new) The method of claim 21, wherein the at least one dicarboxylic acid is selected from the group consisting of adipic acid, azelaic acid, sebacic acid, cyclohexane dicarboxylic acid, terephthalic acid, naphthalene dicarboxylic acid, isophthalic acid, the lower (C₁ to C₆) alkyl esters of said dicarboxylic acids, and blends thereof.